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Leadership and Management Education and Training (LMET): its relationship to shipboard effectiveness and readiness

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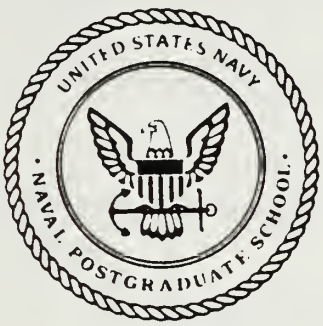

THESIS

LEADERSHIP AND MANAGEMENT EDUCATION AND TRAINING (LMET): ITS RELATIONSHIP TO SHIPBOARD EFFECTIVENESS AND READINESS

by

Teresa C. Cissell
and
David P. Polley

December 1987

Thesis Advisor: Carson K. Eoyang

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Leadership and Management Education and Training (LMET): Its Relationship to Shipboard Effectiveness and Readiness

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December 1987

ABSTRACT

A macro-level correlation analysis was conducted to discover whether the Leadership and Management Education and Training (LMET) of supervisory personnel on Navy ships is systematically related to measures of effectiveness (MOEs) such as exercise and inspection scores, Unit Status and Identity Report (UNITREP) combat readiness ratings, and personnel retention. The results showed few significant relationships between the majority of MOE and LMET variables. In fact, correlations which appeared significant were not present in both fleets. Many of the significant correlations were counterintuitive. Several suggestions for improved research in the area of LMET evaluation and fleet measures of effectiveness are offered.

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I. INTRODUCTION

The purpose of this analysis is to discover whether the Leadership and Management Education and Training (LMET) of supervisory personnel in Navy commands is systematically related to measures of effectiveness (MOEs) such as exercise and inspection scores, Unit Status and Identity Report (UNITREP) combat readiness ratings, personnel retention, etc. The two focal questions of interest are: do increased proportions of LMET trained officers and enlisted supervisors relate to improved readiness and effectiveness; and does the length of time since having LMET "dilute" the effects of having had the course?

A. ORGANIZATION OF THE THESIS

The first chapter is an Introduction discussing the purpose of the thesis and describing the elements of the study. Chapter II briefly chronicles the historical aspects and development of LMET. Previous research in LMET and shipboard measures of effectiveness (MOEs) are discussed in Chapter III. The techniques used in data collection and analysis are the subjects of Chapter IV. In Chapter V, results are presented in the form of correlation coefficients between MOEs and 1) percentages of supervisory personnel onboard with LMET and 2) average length of time since personnel have been LMET trained. Chapter V also deals with the relative significance of the data. Chapter VI presents the authors' interpretation of results and limitations in applying them. Conclusions and recommendations for improving the Navy's leadership program are discussed, as are recommendations for further research.

B. DEFINITION OF LMET

LMET is a formal, Navy specific training program designed to prepare supervisors and managers for leadership and management positions at key (threshold) points in their careers. LMET is based on research done by McBer and Company, of effective Navy leader behavior (as is discussed in Chapter II) and focuses on specific skills and individual initiative. LMET is now taught at 21 sites to about 30,000 Navy personnel each year. In fiscal year 1980 LMET cost the Navy about $17 million [Ref. 1]

'p. 207' in 1986 the approximate cost of LMET was $21 million.[1] There are 19 varieties of the course--each geared to the appropriate level in the chain of command (i.e. Leading Petty Officer, Senior Officer) and tailored to the warfare or staff community (surface, aviation, medical, supply) [Ref. 2: p. vi]. LMET uses lecture, case studies, role playing, simulations, small group discussions, instrumented feedback (self assessment questionnaires), and individual written and reading assignments to convey to participants leadership competencies.[2] [Ref. 2: p. 39]

C. BASIS FOR RESEARCH

Both authors of this thesis have attended LMET, LCDR Polley in 1981 and LT Cissell in 1982. They found it to be interesting and helpful to them. Their interest in researching this topic was encouraged by a request from NMPC-62 to analyze the relationship between LMET and unit effectiveness.

An article published in *Navy Times* earlier this year [Ref. 4], discussed a study sponsored by Naval Military Personnel Command (NMPC-62) Leadership and Command Effectiveness Division [Ref. 5] on what percent of their time Navy personnel spend in each of three areas: Technical Tasks, Leadership and Management. The study also asked its 983 respondents how well prepared they were for these tasks. The study found the individuals perceived themselves to be spending more time on leadership and management tasks than technical tasks as early as E-6. Findings also showed that a significant majority of respondents felt less prepared for leadership and management tasks than for technical tasks. An unnamed source in the *Navy Times* article said, "We're (the Navy's) just not spending enough time and energy on leadership." "Only 21,000 enlisted persons a year--nine percent of the 240,000 in paygrades E-5 through E-9--go through LMET. Considering turnover,...that figure is appallingly low."

If LMET can be more directly tied to those criteria that are considered to be valid measures of effectiveness and readiness, then perhaps more effort will be made to ensure that more supervisors and managers receive the training before they enter a leadership position. If LMET does not relate to command effectiveness, then what specific areas of LMET should be targeted for reform?

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[1] Information supplied by NMPC-62.

[2] A competency, as McBer defines it, is "a knowledge, skill, ability, motive, or other characteristic that can be demonstrated to relate directly to competent occupational performance" [Ref. 3].

In 1986 about 7,500 officers and 20,800 enlisted personnel attended LMET.[3] Most attended through some training pipeline; that is, they went to the training as part of a string of schools scheduled between duty stations. LMET is required for all supervisory/leadership personnel (E5 - O5) prior to assignment to:

a) arduous sea duty,
b) unaccompanied overseas shore duty,
c) unaccompanied non-rotational sea duty, or
d) neutral duty (neither sea nor shore duty).

This requirement may be waived if 1) operational commitments override; 2) no quota is available; 3) the member is going from one outus (outside continental United States) billet to another; or, 4) that person has already attended LMET.[4] In addition to those attending LMET between duty assignments, about one-third of LMET seats are filled by TAD (temporary additional duty) students. These are people who come to LMET from a unit and then return to that same unit after the training.

LMET, as it exists now, lasts one week (as in the case of Basic and Advanced Division Officer LMET), two weeks (as in Leading Petty Officer (LPO) and Leading Chief Petty Officer (LCPO) courses), or just two days (as in the case of the Command Effectiveness Seminar). LMET, in its present form, is best described as an evolutionary form of the original LMET course designed in cooperation with McBer and Co. around 1977. Chapter II discusses the events leading to the development of LMET and why it was needed.

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[3] Information supplied by NMPC-62.

[4] Information supplied by NMPC-482.

II. BACKGROUND

A. MILITARY LEADERSHIP

Good leadership is essential to the effectiveness of any organization. One finds, however, little agreement among scholars, researchers, or practitioners as to what *leadership* is, much less how to define *good leadership.* Definitions and theories range from those focusing on an individual's personality and genetic traits to those describing leadership more as a process involving interaction between organizational purpose and individual behavior.

Competent military leadership is essential to the effectiveness of each military unit as well as to the success of the U.S. Defense Department in accomplishing its goals. Military organizations have unique missions which often require humans to perform tasks which might otherwise be considered inappropriate, immoral, or even unlawful in any other setting. The military also may require submission to stricter rules, adverse environmental conditions, and any number of tasks contrary to personal preference. The men and women in the armed services are expected to perform ever more diverse and demanding tasks with existing or often fewer resources. The future role of the Navy as well as that of other services will place increasing pressure on military leaders to do more and better with less. The shape of the future, because it points to increased technology, automation, and reduced manning levels, only sharpens the need for Navy officers and senior NCOs to acquire requisite leadership and management skills.

In seeking those skills encompassed by leadership and management, one must first understand the concepts: how do key people in the Navy define leadership and management? In a June 1987 conference on leadership held at the United States Naval Academy[5] VADM William Rowden, Commander Naval Sea Systems Command, distinguished leadership from management by defining leadership as "the ability to motivate people" and management as "a process of getting things done" [Ref. 6: p. 3]. Also at the conference, Professor Ben Schneider, University of Maryland, made a

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[5]On June 10-12, 1987, the Naval Academy and Navy Personnel Research and Development Center (NPRDC) co-sponsored a conference on leadership. There were 90 participants and 35 speakers. Twelve active and retired flag officers attended included ADM Trost, Chief of Naval Operations. Several academic researchers in the leadership field spoke as did the Master Chief Petty Officer of the Navy.

similar distinction: leadership is "energizing and directing others" and management is "a process of getting things done" [Ref. 6: p. 3]. Admiral Rowden also said that management is more easily learned than leadership. Perhaps this is because there is greater agreement over what management is while leadership still exists in a haze of theory and disagreement.

B. HISTORY OF NAVY LEADERSHIP TRAINING

Since World War II, the Navy has focused most of its training efforts on the individual as he/she first enters the service. Some highly technical ratings/designators require that the service member attend as much as eighteen months of classroom and practical training before being assigned to his/her first experience tour. Leadership and Human Resources Management topics are typically included in Academy curricula, recruit training, Officer Candidate School classes and at other "source" schools. Leadership training did not, however, receive serious consideration until the 1950's when symptoms such as a proportionally large brig population prompted action by the Secretary of the Navy to "shore up" leadership deficiencies [Ref. 1: p. 197]. In 1958, General Order 21 was issued. It defined leadership[6] and ordered Commanding Officers to incorporate leadership training into their command training plans. With minimal real change resulting from the order, it was re-issued in 1963 but again was ineffective perhaps due to the lack of assistance or specific guidance given to commanding officers [Ref. 1: p. 198]. In 1966, leadership training was incorporated into General Military Training (GMT). Each sailor was to receive ten hours per year in leadership style, chain of command, authority, responsibility, and accountability.[7] With standard lesson plans and material, leadership training was scheduled five times annually along with venereal disease prevention and blood donorship.

In 1970, then Chief of Naval Operations (CNO), Admiral Zumwalt, laid the groundwork for the Human Goals Program, later to be called Human Resources Management Support System, which encompassed leadership training, racial awareness, drug and alcohol counseling, and overseas diplomacy. A new two-week

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[6] Leadership is the art of accomplishing the Navy's mission through people. It is the sum of those qualities of intellect, of human understanding and of moral character that enable a man to inspire and to manage a group of people successfully. Effective leadership, therefore, is based on personal example, good management practices, and moral responsibility. [Ref. 7]

[7] With the exception of leadership style, these topics are now taught in an eight hour command level workshop: "Military Rights and Responsibilities."

formal, external (to the command), Leadership and Management Training (LMT) course represented the leadership portion of the new program. It was authorized to be taught at fifteen sites, but the demand for quotas exceeded the supply and "bootleg" versions of the course were created (over 150 unauthorized courses) [Ref. 8].

In August 1974, shortly after he relieved ADM Zumwalt as CNO, ADM Holloway ordered a review of all officer and enlisted leadership and management training. The Chief of Naval Education and Training (CNET) convened a panel headed by CAPT Carl Auel (Chaplain Corps) assisted by Fred Fiedler (a scholar in the leadership field). Over a three month period, the panel examined earlier and existing leadership training and proposed a method for designing an "ideal" training model. Their report refered to development of a *system*, not a course, implying that much more than a single course would be necessary to correct the leadership training program. "Without an LMET system, the first phase of which is a clear and comprehensive definition of requirements by line managers, any further expansion, consolidation, or reprogramming of current training efforts would meet fleet needs at the level of chance." [Ref. 9: p. iv]

It was in 1975 that McBer and Co. became involved in the Navy Human Resources Management Program. McBer, a Boston-based consulting firm established by Dr. David C. McClelland and David Berlew in 1970 [Ref. 10: pp. 35 & 39], was contracted to improve the effectiveness of Human Resource Management (HRM) Specialists. McClelland, a Harvard psychologist, had focused much of his work on improving the screening process for hiring employees. He found that in many organizations, the tests they were using to screen applicants tested for academic potential rather than for skills that would be reflected in job proficiency. McClelland believes that people should be hired and trained based upon competencies. "Competencies are not aspects of the job but characteristics of the people who do their job best." [Ref. 10: p. 40]

After identifying what behaviors superior HRM specialists demonstrate better or more often than average specialists do, McBer devised a training model based on "competencies" [Ref. 11]. McClelland's theories on competencies and how they relate to achievement are explained in further detail in *The Achieving Society* [Ref. 12] and "Testing for Competence Rather Than for 'Intelligence'" [Ref. 13].

McBer's approach--to sample (using Behavioral Event Interviews)[8] high performers and average performers to train people to do those things that separate high performers from their peers--had both scientific and practical appeal to the Navy. In January 1976, after abandoning internal efforts to develop a new leadership training program, and under high level pressure to produce tangible results, several civilian contractors were asked for proposals. The unconventional approach of McBer was selected. Using the same technique employed in the Navy HRM Project, McBer analyzed the results of interviews with Navy supervisory personnel previously categorized by thier commanding officers as either superior or average leaders. [Ref. 1: pp. 204 & 205] In 1976, McBer began sampling Navy Leading Petty Officers, Chief Petty Officers, and Commissioned Officers first on the West Coast and then on the East Coast. Their first model included twenty-seven competencies. In 1978 and 1979, pilot courses were taught by Navy instructors and evaluated by System Development Corporation [Ref. 16]. Evidently, these early courses were based on all twenty-seven competencies. To validate their findings, McBer later sampled 1,000 Navy officers and enlisted personnel using nine tests to measure competency elements. Behavioral Event Interviews were also conducted on a subset of 100 testees. Sixteen of the original twenty-seven competencies were found to be significantly related to superior leadership in the validation phase. These sixteen competencies, listed in Table 1, are now the backbone of most of the current LMET courses.

The premise behind LMET is that the sixteen competencies can be learned, and increased use of the competencies will lead to better leadership and management and hence improved effectiveness. LMET competencies are acquired through a five-step process:

1. Recognition (identifying knowledge, skills, values, etc. present in cases/incidents)
2. Understanding (integration and connection with one's own experience)
3. Self Assessment in Relation to the Competency (discovery of one's own level in each competency and identification of areas for specific improvement)
4. Skill Acquisition and Practice (practical exercises/classroom applications)

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[8] Behavioral Event Interviews are similar in technique to the Critical Incident Interview developed by Flannagan during WWII [Ref. 14]. Each subject is asked to describe in detail unsuccessful and successful events in his/her career. Thorough probing by the interviewer leads to a clear account of what lead to the event, who participated, and the interviewee's behavior and feelings in that situation. [Ref. 15]

TABLE 1
LMET COMPETENCIES

1. Sets Goals and Performance Standards
2. Takes Initiative
3. Plans and Organizes
4. Optimizes Use of Resources
5. Delegates
6. Monitors Results
7. Rewards
8. Disciplines
9. Self-control
10. Influences
11. Team Builds
12. Develops Subordinates
13. Positive Expectations
14. Realistic Expectations
15. Understands
16. Conceptualizes
[Ref. 17]

5. Job Application (classroom feedback and identification of goals, action steps, and obstacles on one's next job) [Ref. 15].

Initially LMET was taught at five levels: 1) Commanding and Executive Officers, 2) Department Heads, 3) Division Officers, 4) Leading Chief Petty Officers (LCPOs), and 5) Leading Petty Officers and at two sites: Little Creek, VA and Coronado, CA. Since then, LMET sites have expanded to 21 locations. LMET has since been tailored to the specific needs of each of the warfare communities as well as to staff commuunities such as Navy Medical Command (NAVMED). [Ref. 2: pp. vi and 43-48]

In 1983, a resurvey by McBer consultants essentially validated the "Fleet Competency Model" with some modification on earlier competencies. Improvements in their methodology also allowed specification of the type of situation a given "critical incident" was observed in. This allowed training to focus on how one might deal with a variety of situations, i.e., when to employ which competencies. [Ref. 2: pp. 50-51]

More recently, the Command Effectiveness Study[9] results have had an impact on LMET content, particularly the courses for Prospective Commanding and Executive Officers (now replaced by the Command Effectiveness Seminar) and the LCPO course. Essentially LMET has been shaped not only by the initial research done by McBer, but also by feedback from participants, evaluations made by observers, and subsequent research.

LMET is now the approved method for Naval leadership and management training. The course components have not, however, been systematically included in Naval Academy curricula, Officer Candidate School classes, or Navy Reserve Officer Training Corps (NROTC) requirements.

[9]The results of the Command Effectiveness Study are discussed in Chapter III.

III. LITERATURE REVIEW

In a memorandum for the record by Naval Military Personnel Command, NMPC-6, dated December 7, 1978, an evaluation plan for LMET was laid out in four phases:

1. A review of LMET to date
2. Course validation
3. LMET delivery to the Navy
4. LMET evaluation

Phase four called for a longitudinal evaluation of the impact of LMET on both individuals and their organizations. While several efforts have been made to discover the impact on individuals (as discussed in the following section) no evidence was found that any thorough study has been done to discover the impact LMET has had on ***organizational*** effectiveness.

A. PREVIOUS EVALUATIONS OF LMET

1. NPRDC/ONR/NPGS (1977)

McBer's initial work in identifying competencies and designing the training was scrutinized by several professionals among whom were Dr. R. F. Morrison of Navy Personnel Research and Development Center (NPRDC), Dr. B. T. King of the Office of Naval Research (ONR), and Dr.s C. K. Eoyang and R. S. Elster of the Naval Postgraduate School (NPGS). Some of their concerns were:

- a very small, unrepresentative sample (n = 36) in developing the 27 competencies (King and Elster)
- reliance on supervisor evaluations and behavioral event interview results (rather than including direct observation and peer and subordinate perceptions) (King and Eoyang)
- inappropriate coding techniques (1 = attribute present regardless of how often; 0 = attribute not present, i.e. wasn't brought up in the interview) (Morrison)
- shaky statistical techniques:
  - * multiple regression used to "predict" superior performance ratings using 27 competencies (independent variables) for such a small sample (King)
  - * multicolinearity of variables (Eoyang)

* factor analysis using two few cases (Morrison)
* significance testing at the .10 level (King)[10]

After such sharp criticisms, it is surprising that LMET ever got off the ground. It would appear that McBer's competencies, however arrived at, intuitively appealed to reviewers and are similar to other characteristics of successful leaders such as those found in the *Handbook of Leadership.* by Stogdill.[11]

2. SDC (1979)

Between May 1978 and May 1979, System Development Corporation (SDC) evaluated LMET pilot courses for Leading Petty Officers (LPOs), Leading Chief Petty Officers (LCPOs), Prospective Commanding and Executive Officers (PCO/PXO) and LMET instructors. Objectives of the assessment were: (1) to perform on-site evaluations of the delivery of the courses; (2) to review instructor guides and student journals; and (3) to provide specific recommendations for management decisions concerning the assignment of Navy instructors to deliver the courses.

The SDC assessment was not intended to measure impact of the training on subsequent performance, but did attempt to discover whether students were receptive to the course material and absorbing any of it. A sample of SDC's findings:

- Navy instructors were in need of training in facilitation techniques.
- Course materials needed to be "de-civilianized", that is, made more suited to military needs and situations.
- Participants enjoyed the courses.
- Time boundaries limited the ability to use very many practical exercises.
- SDC recommended courses be standardized and offered to all targeted levels of Navy personnel. [Ref. 16]

It is interesting to note that SDC also participated with McBer in the data gathering phase of the LMET project [Ref. 3]. Their expertise in LMET design is useful; however, one might question their complete objectivity as they may have had some stake in the success of LMET.

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[10] Excerpted from memorandums written by Dr. Morrison, Dr. King, Dr. Elster, and Dr. Eoyang in response to requests to review McBer's research. These memos were supplied by Dr. Carson K. Eoyang, PERSEREC, from his personal files.

[11] These characteristics include but are not limited to: intelligence, energy, judgement decisiveness, integrity, achievement drive, dominance, drive for responsibility, initiative, sociability, assertiveness, emotional balance and control, and ability to enlist cooperation. [Ref. 18: pp. 74-75].

3. **Davies (1980)**

In his thesis Davies discussed the need for the Army to evaluate its leadership training. He presents an extensive review of the leadership theories contributing to the Army's organizational leadership model, their training programs, and the leadership training of the other services.

In his discussion of the development of the Navy's LMET program, Davies traces the evolution from the early 1970's when the Navy had 157 different leadership courses through the research by the McBer Company which identified the sixteen competencies which form the basis of the current LMET courses. He also notes that there has been no formal evaluation of LMET, although at the time of his work (1980) the Chief of Naval Education and Training (CNET) was "progressing toward an internal evaluation plan to determine whether the course is actually teaching what it was designed to teach." [Ref. 19]

As discussed by Davies and elsewhere in this thesis, the evaluation of LMET is complicated by the lack of a control group within the Navy. This is because the Navy has adopted the policy of not denying LMET training to any personnel for the purpose of establishing a control group.

In presenting his recommendations, Davies proposed two separate plans, the organizational leadership training evaluation plan and the Army's Leadership and Management Development Course evaluation plan. Within each of these areas he offered specific objectives and steps to measure the achievement of the objectives. One of his lower echelon divisions is organizational performance for which the stated objective is: to determine if the leadership training program is reflected in changes in the operational performance of the units to which the newly trained leaders are assigned. Although this objective roughly parallels the purpose of this thesis, there are numerous and significant differences between the Army's program and the Navy's LMET program, thus precluding further development along the path which Davies has laid out. For example, the Army takes a decentralized approach for its Leadership and Management Development Course, allowing these experience based workshops to flow according to the needs and backgrounds of the individuals attending. Whereas the Navy has adopted a strict, centrally controlled format for its LMET courses.

In summary, Davies achieves his stated purpose of raising the question of evaluation of the Army's leadership program and of offering a plan whereby the issue of training effectiveness can be studied. That such an ambitious evaluation scheme as

he proposes will ever be undertaken by the Army or any other agency is questionable because such an evaluation would require a high level of commitment including several million dollars for the research effort alone.

4. **Parker (1981)**

Donald F. Parker is a retired Navy Captain and (in 1981 when this reference was published) was Assistant Professor of Organizational Behavior and Industrial Relations in the Graduate School of Business Administration at the University of Michigan. Immediately preceding his retirement from the Navy he was CO of the Navy Personnel Research and Development Center. In a chapter he wrote for *Military Leadership* [Ref. 1], Parker reviews the events leading up to LMET development, the research upon which LMET is based, and LMET course design and delivery.

The following are some of the findings and conclusions made by Parker:

- LMET could have been developed with internal expertise.
- LMET was not designed with a clear comprehensive definition of requirements as was recommended by a panel headed by Chaplain Auel [Ref. 9].
- LMET was not developed under the Interservice Procedures for Instructional Systems Development (ISD) which Parker believes led to inadequate learning objectives; inconsistencies between tests, instruction material, and stated objectives; and difficulty in measuring the success of the training.
- Analysis for LMET design was "deficient with respect to concept definition, research design, data collection, data analysis and interpretation" [Ref. 1: p 198].
- LMET courses don't include the concept of contingency, i.e., how to select appropriate behaviors in differing situations.

From his observations of classroom training, Parker found that the flow from lecture to discussion to small group activities helped to maintain student interest and provided frequent opportunities for students to express their opinions and trade ideas with peers. He found that in practice LMET instruction differed somewhat from class to class and location to location as instructors sought to motivate each group. He also found that the course was well accepted by students. [Ref. 1: pp. 207-208]

5. **Vandover and Villarosa (1981)**

In 1981 Vandover and Villarosa, two Naval Postgraduate School students, interviewed a cross section of 51 LMET graduates and their immediate supervisors and subordinates from 13 operational commands. In their pilot study for evaluation they sought to discover any improvements over non-graduates in the knowledge or behavior of LMET graduates. They found no systematic link between LMET and leadership related behavior changes. However, some of the trends they discovered include:

- Seniority of graduates appeared to negatively correlate with behavior change.
- Evidence of behavioral changes as a result of attending LMET were greatest among Leading Petty Officers (LPO's) and lowest among Chief Petty Officers (CPO's).
- People who were marginal performers before the training, experienced more impact from the course.
- Knowledge/familiarity with LMET competencies seems to deteriorate after as little as six months following training.
- Graduates' perceptions of their own improvement after training were not validated by their supervisors and subordinates.
- Graduates who were members of high-performing, effective units were more likely to have shown behavioral improvements after training. [Ref. 20]

6. **Abe and Babylon (1982)**

Using McBer's Behavioral Event Interview technique, Abe and Babylon, two Naval Postgraduate School students "...sought to find if the specific competency of delegation is more often demonstrated by superior Navy personnel and if LMET training has any significant impact upon managerial effectiveness and the use of delegation".

They found no relationship between LMET attendance and use of delegation. Superior performers did not use delegation more than average performers. LMET graduates were equally distributed among superior and average performers. One statement they made was particularly astounding: "The fact that delegation is taught in LMET but not used in daily performance could also be used to suggest that the Navy is an unfavorable environment in which to practice the skills learned in LMET" [Ref. 21].

Perhaps LMET's design by civilian consultants, who had very little Navy specific experience, has resulted in training unsuited for the Navy environment (or as LCDR Foley suggests [Ref. 22], unsupported by unit effectiveness).

7. **Foley (1983)**

Another Naval Postgraduate School student, LCDR Patricia Foley, interviewed 70 LMET graduates seeking to discover what incentives and constraints affect the utilization of LMET competencies. She found no statistical differences between LMET graduates and the control group. Through her interviews, she found the following organizational factors influenced the use of competencies by graduates:

- Time constraints
- Manning constraints

- Leadership example as set by superior
- Communications flow
- Attitude towards inspections (short sightedness)
- Lack of emphasis on subordinate development
- No support by senior members of the command
- Lack of a reward system for competency use

Those who had demonstrated behavioral changes that they attributed to LMET exhibited these characteristics:

- A strong desire to change their behavior
- Felt they had room for improvement in leadership and management
- Were more likely to be junior with some leadership experience
- Returned directly to management positions after graduating
- Had some initial success in practicing the competencies
- An immediate superior or peer had served as good role model
- They were more likely to be assigned to a command noted for its organizational effectiveness and that stresses subordinate development

She recommended that LMET be continued and reinforced at the unit level and that, through the HRM program, commands improve communication, stress subordinate development, and improve problem solving techniques. [Ref. 22]

8. **Glenn (1987)**

Mike Glenn, a former Navy Organizational Effectiveness Consultant presently working at Naval Training Systems Center in Norfolk, VA, is finishing a doctoral dissertation on "Senior Management Perceptions of Actions to Support Post-Training Utilization of (LMET)". Of specific concern to Mr. Glenn are the following:

* Which management and supervisory actions in support of Job Linkage and Follow-up[12] do senior Naval managers perceive to be important for their subordinate managers/supervisors?
* To what extent do senior Naval managers perceive that the important management and supervisory actions in support of Job Linkage and Follow-up are practiced in their organizations by their subordinate managers/supervisors. [Ref. 23]

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[12]*Job Linkage* and *Follow-up* refer to specific activities in this dissertation. *Job Linkage*, as Glenn defines it, is re-entry of the trainee into the workplace. He defines *Follow-up* as on-going support of learned behaviors on the job.

He surveyed 106 Navy operational commands asking senior managers to rate the importance of various actions which may be taken by management to support the full use by personnel, on the job, of behaviors learned in LMET. He also asked them to indicate whether they had ever observed each action in any organization and in their present command. So far he has found that senior Navy managers believe assignment of a role model (supervisor or co-worker), trainee goal setting for job performance, and trainee environment are important to Job Linkage.

9. **LMET Sites**

At least two LMET sites are gathering data from Commanding Officers (COs) of Temporary Additional Duty (TAD) attendees about six months after graduation.[13] Their purpose is to gauge whether the COs are pleased with the "results" of LMET. Their questions include:

- Has the individual's leadership and management performance improved after completing LMET?
- What improvements in performance if any have been seen since attending LMET?
- What improvements have you seen in the work group?

One site found that about 64 percent of COs responding noticed an improvement in the performance of graduates. The sample size is *very small* thus far (n= 18), but the effort shows considerable promise in specifying what LMET does for graduates and their commands.

10. **Command Effectiveness Study (1985)**

Although not specifically related to LMET, this study, done by McBer and Co., turned from a focus on ***individual*** performance to characteristics distinguishing superior from average ***commands.*** After identifying criteria/indicators of superior command performance, a sample of outstanding and average operational commands were observed, interviewed and surveyed.

Four survey instruments were used in the study:

- Navy Competency Assessment Profile (NCAP) - asked respondents to rate themselves on the sixteen fleet competencies and whether they had attended LMET.

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[13] Correspondence with LMET sites in Little Creek, VA and Mayport, FL, revealed that earlier this year they began sending questionnaires to Commanding Officer's of TAD attendees about six months after they graduated.

- Command Information Questionnaire (CIQ) - replaced the NCAP in the second phase of the study (84-85); asked people to rate their command on the characteristics of superior commands identified in the first phase of the study (1983)
- Systematic Multiple Level Observation of Groups (SYMLOG) - designed to identify the dynamics of work groups in terms of the roles assumed by individual group members
- Commitment Index - used as a supplement to the SYMLOG; assessed the level of commitment personnel felt to their job and command

The reason given for replacement of the NCAP in the second phase of the study was: "Although relevant to competencies, the NCAP results were not useful in understanding differences between superior and average commands" [Ref. 25].

In a pilot test of the NCAP in 1983, 100 Navy enlisted personnel answered the questionnaire. The conclusion was:

> Although the overall competency rating scores did not differ significantly as a function of LMET training, LMET-trained individuals were better able to differentiate their abilities in using the competencies. Persons without LMET training tended to rate themselves similarly on all 16 competencies. [Ref. 2: p. 50]

Despite the drawback of using a self assessment instrument such as the NCAP to measure the effect of LMET; these statements are supported by some of the studies discussed previously.

The primary product of the Command Effectiveness Study was a model of an organizational system whose "parts" are interrelated. These components have certain characteristics which distinguish the superior organization from an average one. The model consists of three areas which are further broken down into thirteen levels:

- People
  - CO
  - XO
  - Wardroom
  - Chief's Quarters
  - Crew
- Relationships
  - CO - XO
  - Chain of Command
  - External
- Activities

- Planning
- Maintaining Standards
- Communicating
- Building Esprit de Corps
- Training and Development

The results and lessons learned through the Command Effectiveness Study (CES) are the basis for the Command Effectiveness Seminar (also known as the Command Excellence Seminar). CES results have also been incorporated into most of the LMET courses. [Refs. 24,25]

11. **Command Excellence Seminar Feedback Analysis (1987)**

This Caliber Associates report summarizes an analysis of feedback (course critique) sheets filled out by 215 Command Excellence Seminar attendees. The objective of the report was to identify results related to improved mission readiness experienced by seminar attendees by conducting a content analysis of two items from the feedback sheets. These items asked the respondent to give examples where the seminar helped them or their commands do the job better.

The responses were fairly homogeneous in that virtually everyone reported some type of improved performance in, or greater awareness of some dimension of leadership. Overall, the report indicated that the Command Excellence Seminar is beneficial. Participants responded enthusiastically and attribute considerable personal success to the course. The data did not support any specific conclusions regarding "outcomes" in the form of organizational impact from the course. This was due in part to the lack of specificity in the feedback questions and exploratory nature of the analysis. [Ref. 26]

12. **Summary**

What can be learned about the effectiveness of LMET from the studies presented thus far? Training evaluation is often categorized into four types of measures:

1) Participant Reactions
2) Evidence of Learning
3) Evidence of Behavioral Change and
4) Results in Operations (impact on organizational effectiveness). [Ref. 27]

a. Participant Reactions

In reading the studies discussed earlier and in corresponding with former and current LMET instructors we found that students generally react positively to LMET. Many have stated that they wish they could have attended earlier in their careers.

b. Evidence of Learning

Pre and post-testing of students by SDC during their assessments of pilot courses indicated that students were gaining expected knowledge levels. But Vandover and Villarosa's [Ref. 20: p. 87] observation regarding deterioration of knowledge after as little as six months leads one to conclude that much of the material learned is short-lived.

c. Evidence of Behavioral Change

This was the primary focus of three of the Naval Postgraduate School theses [Refs. 20,21,22]. None of them found a systematic link between LMET attendance and improvement in leadership behavior. They *were* able to discover some individual and organizational factors that intervene in behavioral changes. Glenn's approach in his dissertation is to discover these factors through the perceptions of senior managers [Ref. 23].

d. Results in Operations

As stated earlier, this ground is yet uncovered in LMET evaluation. There are a number of reasons why such research has not been done yet, including:

- Lack of a "control group" (a command or unit completely unaffected by LMET)
- No baseline research on effectiveness levels prior to LMET implementation
- Many uncontrolled intervening variables
- Instability of measures of effectiveness (MOEs).

B. STUDIES ON MEASURES OF EFFECTIVENESS

How then can LMET be evaluated as to its effect on mission effectiveness and readiness? The first step is to select criteria that reasonably represent mission capability. Three studies in this area are presented from which several candidate dependent variables have been gleaned.

1. **Horowitz (1986)**

Dr. Horowitz found at least fifteen studies identifying quantitative links between Manpower, Personnel, and Training (MPT) factors and unit performance. Several of these studies address the payoff to training. He suggests such measures as:

- Operational Propulsion Plant Examinations (OPPEs)
- Operational Readiness Examinations(OREs)
- Selected Exercises (including live firing exercises)
- Excellence Awards (such as Battle Efficiency "E")
- Bombing scores (for aviation units)
- Air Combat Maneuvering Ranges
- Simulator performance
- Casualty Reports (CASREPs)
- Unit Status and Identify Reports (UNITREPs)
- Board of Inspection and Survey (INSURV)
- Maintenance and Material Management (3M)

Dr. Horowitz found shortcomings among most of the measures yet he did not see them as insurmountable barriers to research in the area of relating MPT factors and unit MOE's. For example:

- Training exercises such as OREs and OPPEs are prepared for, and would therefore reflect an "upper bound" on performance.
- For selected exercises failing grades may not be numerically recorded.
- Only one ship per squadron can be awarded the Battle "E".
- CASREPs and UNITREPs are self-reported, not objective and criteria vary widely among commands.
- 3M data suffers from reporting errors and differences from ship class to ship class and over time. [Ref. 28]

2. **Davilli and Schenzel (1986)**

Davilli and Schenzel, two Naval Postgraduate School students, used Refresher Training (REFTRA) ORE and Battle Problem scores as dependent variables in creating Multiple Regression Models of the relationship between readiness and a number of manpower, training, and other evaluative measures. They used a small sample of ships (n=44), however, and had to obtain much of the data by physically searching through REFTRA files in Guantanamo Bay, Cuba.

Assuming ORE is a universally accepted measure of readiness, Davilli and Schenzel's results indicate a multivariate approach to predicting readiness is feasible. The variables with the greatest predicting power (Beta coeficient and significance level) in their model were billet vacancies at 90 days and 180 days prior to ORE. Variables such as average drill periodicity, average school qualification, and average watch qualification 30 days prior to ORE were poor predictors (low significance and Beta coefficients, and (for one variable) the opposite sign than was expected). [Ref. 29]

3. **Chatfield and Morrison (1987)**

Researchers at NPRDC assessed the consistency and stability of 20 surface ship measures of effectiveness from fiscal year 1982 to 1984 [Ref. 30]. Their purpose was to create a pre-change baseline that could be used later in evaluating the effect of the new Surface Warfare Officer (SWO) career path on readiness and performance. They proposed using a multiple measure approach, assuming that no single measure was an appropriate evaluation standard. The unit measures they looked at included:

- PEB (Propulsion Examining Board)
- PMS (Preventive Maintenance System)
- NWTI (Nuclear Weapons Technical Inspection)
- REFTRA (Refresher Training) Quick Look
- Post-TRE (Training Readiness Evaluation)
- CASREPs (Casualty Reports)
- Personnel Retention
- TRA (Training Readiness Assessment)
- CSRT (Combat System Readiness Test)
- Safety Inspection
- Command Inspection (done by immediate superior command)
- INSURV
- ARE (Aviation Readiness Evaluation)
- Battle "E" competition
- PQS (Personnel Qualification System)
- UNITREP

Chatfield and Morrison found that data on ship performance had poor year to year stability and was inconsistent among different MOEs for the same ship. They concluded that the measures were too unstable to use as a baseline for evaluating policy revisions. They did not recommend collection or analysis of other measures as it

would likely lead to similar results. Instead Chatfield and Morrison recommended review and revision of MOEs to improve their reliability and validity.

IV. METHODOLOGY

A. SELECTION OF VARIABLES

After reviewing the studies cited in chapter III and phone conversations with type commander staff members about what the admirals look at in determining which ships get the Battle "E", the following measures of shipboard effectiveness were selected:

- Percent (of an eighteen month cycle) time spent in each of four C-ratings[14] as reported on UNITREPs.
- REFTRA scores[15]
- 3M PMS inspection scores
- OPPE scores
- Supply Management Inspection (SMI) results[16]
- Personnel retention rates[17]

Because a secondary goal of this study was to create a framework for future evaluation of LMET, variables were selected not only on the basis of face validity but also on data availability and potential for quantification. The objective was to obtain data on as many ships as possible through fairly routine reports and records.

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[14]C-rating is an overall status based on a composite of the unit's readiness in four resource areas: 1) equipment and supplies on hand, 2) equipment condition, 3) personnel, and 4) training. A rating of C1 means the unit is fully combat ready, C2 - substantially combat ready, C3 - marginally combat ready, C4 - not combat ready [Ref. 31]. Ships which spent more than half the cycle in programmed overhaul or conversion (C5) were not included. Any time the remaining ships spent in C5 was also subtracted from the total before calculating the percentages.

[15] Because verbal (ordinal) scores were supplied by type commanders these were converted to equivalent (though somewhat arbitrary) numerical scores, i.e., unsatisfactory - 0, satisfactory - 1, outstanding - 2.

[16] Supply Management Inspection results were also provided in verbal (ordinal) terms and were converted in the same manner as REFTRA data: from a series of verbal scores in certain inspection areas. On the advice of a former SMI team member, the areas used to create an overall SMI score were: supply support, food service, retail operations, and aviation supply support (for those ships with a separate division for this purpose).

[17]Net retention rates over the entire 18 month cycle. Net rate equals the number who reenlisted or extended divided by the total number eligible for reenlistment. The rates were given for first term, second term, and career.

The next logical step in the analysis was to measure the training itself. Since there was no control group or baseline measure, the next best alternative was to quantify LMET's existence in each unit. To do this one must know:

- Who was onboard each ship (a minimum of six of the eighteen months) in a supervisory or management position (E5 or above)?
- Who, of the supervisors/managers, has had LMET and when did they attend?

From this information the following variables were gleaned:

- Percent of enlisted supervisors onboard for at least six months who had been to LMET at least once
- Percent of officer personnel onboard for at least six months who had been to LMET at least once
- Percent of both officer and enlisted supervisors who had attended LMET
- Average number of years since enlisted supervisors had attended LMET[18]
- Average number of years since officer personnel had attended LMET
- Average number of years since both officer and enlisted supervisors had attended LMET

Appendix A lists all variables used and the mean, minimum, maximum, and number of ships reporting for each variable.

B. SCOPE

The sample consisted of 285 surface ships. This was all surface ships under Commander Naval Surface Forces, Atlantic and Pacific, less those who were in overhaul or other programmed repair more than half of the eighteen month cycle (January 1985 - June 1986). The eighteen month period chosen is the latest complete competitive cycle.

Since MOEs differ so much among surface, aviation, submarine, and shore activities, it was decided that the analysis should be limited to only the surface community in this preliminary study.

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[18]Since the first LMET courses were taught in 1978, for those who had never attended, their "years since attendance" was set at eight years. The maximum number of years since attending could not be greater than seven (1985 - 1978) for those who had attended. Eight years was chosen so as not to give non-attendance too much weight in this variable.

C. DATA SOURCES

Chief of Naval Operations (OP-64) supplied a tape of C-ratings and corresponding dates for all surface ships.[19] The remaining data on MOEs were collected from type commanders (Commander Naval Surface Forces, Atlantic and Pacific).[20] A list of Unit Identification Codes (UICs) was supplied to Defense Manpower Data Center (DMDC) which in turn provided a tape containing social security numbers of all E5s and above onboard these ships who show up on at least three quarterly manpower reports. This tape was forwarded to Naval Education and Training Command (CNET) in Pensacola, FL where the social security numbers were matched with Navy Integrated Training Resources Administrative System (NITRAS) files of LMET graduates providing data on who had attended LMET and when they attended. Courses numbers and titles supplied to CNET are listed in Appendix B. DMDC cleansed the data of cases in which an individual had attended a school which did not include LMET during the time he/she attended and grouped the data by unit yielding the LMET variables discussed earlier. Further information regarding the data received from NITRAS is included in Appendices C and D.

D. ANALYSIS TECHNIQUE

Because so many variables affecting each ship's readiness and performance are unknown or unavailable, statistical techniques and conclusions are limited to describing hypothetical association between LMET and effectiveness. To estimate the degree of association between LMET variables and MOE variables, the Spearman Coefficient of Rank Correlation ($\rho_{S)}$ was computed. Like other measures of correlation, ρ_S varies from -1 (a perfect negative relationship between two variables) to +1 (a perfect positive relationship between two variables). This non-parametric test was chosen because of the ordinal nature of much of our data and the unsuitability of the data for more classical procedures (randomness, normal distribution, independent observations, etc.). [Ref. 32]

This method of analysis does not lend itself to profound conclusions regarding LMET's effect on unit performance or combat readiness. However this preliminary study is considered to be the first step in designing and testing a model for LMET evaluation against unit effectiveness criteria.

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[19]The information obtained on C-ratings was classified "Secret".

[20]Much of the data obtained from the type commanders were classified "confidential".

V. RESULTS

Results of Spearman's Rho Rank Correlation tests are shown in Tables 2 and 3. They are separated by fleet because of the often extreme differences in scoring, reporting, and standards between the fleets. In fact correlation between many of the variables and fleet was significantly high (ρ_s ranged from .0009 to .4309). Eight out of eighteen were significant at the $\alpha = .05$ level.

In interpreting the results of this correlation, as listed in Tables 2 and 3, one must use caution. First, what do the numbers themselves mean?

The top number is the coefficient of correlation ($\rho_{s)}$ which ranges from negative one (-1) to positive one (+1). This ρ_s measures the strength of the relationship between the two variables adjacent to it in the matrix. A ρ_s of negative one would indicate perfect negative correlation between the two variables, i.e., as one variable increases the other always decreases. While a ρ_s of positive one would indicate that ships with high values in one variable also possess high values of the other variable. Such extreme values then indicate the strongest possible relationships between variables. A ρ_s closer to zero (0) tends to show a weaker relationship between variables, with zero indicating no relationship between the variables. [Ref. 32: p 562]

The second number in each of the "cells" of Tables 2 and 3 indicates the number of cases available to compute that particular ρ_s value. This figure ranges from 24, in the case of the number of ships in the Pacific Fleet for which OPPE scores were available, to 153, the total number of ships in the study from the Atlantic Fleet. As is obvious in observing these figures, not all ships had scores or other measures available for this study. This variation in number of ships sampled for any given inspection/examination reflects differing operating schedules, availability of inspection teams, emergent fleet requirements (which occasionally require cancellation or rescheduling of inspections), and other factors beyond the scope of this study.

The third and final statistic captured in each "cell" of the matrices in Tables 2 and 3 is significance level. This provides the reader an estimate of whether the relationship indicated by ρ_s is probably due to chance or some systematic relationship between the two variables tested. Significance levels as shown in the tables indicate the likelihood that the relationship is merely due to chance, therefore values closer to zero

TABLE 2

SPEARMAN'S RHO RANK CORRELATION COEFFICIENTS
ATLANTIC FLEET

	Percent Enlisted w/ LMET	Percent Officers w/ LMET	Percent Both w/ LMET	Average yr since LMET Enlisted	Average yr since LMET Officers	Average yr since LMET Both
% Time in C-1	.0918 N = 153 sig .259	.0202 N = 153 sig .804	.1295 N = 153 sig .111	-.1027 N = 153 sig .207	-.0137 N = 153 sig .867	-.1323 N = 153 sig .103
% Time in C-2	.0143 N = 153 sig .861	-.0036 N = 153 sig .965	-.0466 N = 153 sig .568	-.0600 N = 153 sig .461	.0621 N = 153 sig .446	.0135 N = 153 sig .869
% Time in C-3	.0270 N = 153 sig .741	-.0357 N = 153 sig .661	.0253 N = 153 sig .756	.0010 N = 153 sig .990	.0035 N = 153 sig .966	-.0180 N = 153 sig .825
% Time in C-4	-.0891 N = 153 sig .273	-.0992 N = 153 sig .222	-.1151 N = 153 sig .156	.1040 N = 153 sig .201	.0247 N = 153 sig .762	.1002 N = 153 sig .218
3M	-.2093 N = 98 sig .039	.1940 N = 98 sig .056	-.0321 N = 98 sig .754	.1904 N = 98 sig .060	-.1903 N = 98 sig .061	.0299 N = 98 sig .770
REFTRA	.1637 N = 50 sig .256	-.0914 N = 50 sig .528	.1019 N = 50 sig .481	-.1534 N = 50 sig .287	.1146 N = 50 sig .428	-.1598 N = 50 sig .268
OPPE	-.1043 N = 98 sig .307	.0397 N = 98 sig .698	-.0313 N = 98 sig .759	.0744 N = 98 sig .467	.0414 N = 98 sig .685	.0101 N = 98 sig .921
1ST term Retention	-.0802 N = 141 sig .344	.1723 N = 141 sig .041	-.0121 N = 141 sig .887	.0029 N = 141 sig .973	-.1691 N = 141 sig .045	-.0640 N = 141 sig .451
2ND term Retention	.0005 N = 139 sig .995	.0822 N = 139 sig .336	.0163 N = 139 sig .849	-.0617 N = 139 sig .470	-.0533 N = 139 sig .533	-.1169 N = 139 sig .170
Career Retention	.0455 N = 139 sig .595	.0096 N = 139 sig .910	.0420 N = 139 sig .624	-.0444 N = 139 sig .604	-.0217 N = 139 sig .800	-.0522 N = 139 sig .542

TABLE 3

SPEARMAN'S RHO RANK CORRELATION COEFFICIENTS
PACIFIC FLEET

	Percent Enlisted w/ LMET	Percent Officers w/ LMET	Percent Both w/ LMET	Average yr since LMET Enlisted	Average yr since LMET Officers	Average yr since LMET Both
% Time in C-1	.0899 N = 132 sig .306	-.1644 N = 132 sig .060	.0204 N = 132 sig .816	-.0870 N = 132 sig .321	.2086 N = 132 sig .016	.0108 N = 132 sig .902
% Time in C-2	-.1602 N = 132 sig .066	-.1800 N = 132 sig .039	-.1999 N = 132 sig .022	.1525 N = 132 sig .081	.1542 N = 132 sig .077	.1801 N = 132 sig .039
% Time in C-3	.0810 N = 132 sig .356	.2538 N = 132 sig .003	.1689 N = 132 sig .053	-.0743 N = 132 sig .397	-.2417 N = 132 sig .005	-.1552 N = 132 sig .076
% Time in C-4	.1567 N = 132 sig .073	.2704 N = 132 sig .002	.2320 N = 132 sig .007	-.1955 N = 132 sig .025	-.2102 N = 132 sig .016	-.2593 N = 132 sig .003
3M	-.1307 N = 122 sig .151	-.0196 N = 122 sig .830	-.1467 N = 122 sig .107	.0756 N = 122 sig .408	-.0004 N = 122 sig .997	.1001 N = 122 sig .273
REFTRA	-.0062 N = 82 sig .956	-.0875 N = 82 sig .434	-.0413 N = 82 sig .712	.0479 N = 82 sig .669	.1671 N = 82 sig .133	.1139 N = 82 sig .308
OPPE	-.2438 N = 24 sig .251	.0820 N = 24 sig .703	-.2067 N = 24 sig .333	.2071 N = 24 sig .332	-.0820 N = 24 sig .703	.1984 N = 24 sig .353
1ST term Retention	-.1689 N = 131 sig .054	.0232 N = 131 sig .793	-.1591 N = 131 sig .069	.1412 N = 131 sig .108	.0177 N = 131 sig .841	.1471 N = 131 sig .094
2ND term Retention	-.2212 N = 131 sig .011	-.0637 N = 131 sig .470	-.2326 N = 131 sig .008	.2460 N = 131 sig .005	.0571 N = 131 sig .517	.2678 N = 131 sig .002
Career Retention	-.2542 N = 130 sig .004	.1567 N = 130 sig .075	-.1797 N = 130 sig .041	.2601 N = 130 sig .003	-.1675 N = 130 sig .057	.1911 N = 130 sig .029
SMI	-.0777 N = 123 sig .393	-.0931 N = 123 sig .306	-.1305 N = 123 sig .150	.0794 N = 123 sig .383	.0312 N = 123 sig .732	.1287 N = 123 sig .156

allow the researcher to reject the null hypothesis (that the two variables are unrelated) and conclude that the two variables are related.

Once it appears that the two variables are related to each other, the sign (- or +) of ρ_s should be reexamined. This is the point at which extreme caution should be taken with regard to interpretation. Many of the variables indicate poorer performance as their values increase. For example, "percent time in C-4 (not combat ready)" - as it increases, readiness of the ship decreases; "average years since attending LMET" - as this value increases, the LMET training (if any) of personnel onboard is "rustier".

A. ATLANTIC FLEET RESULTS

Only two of the measures of effectiveness have a significant correlation (at the $\alpha = .05$ level) with any of the LMET variables. These are 3M scores and first term retention rates. The 3M scores show a relationship to the percentage of LMET graduates, both enlisted and officer, but in opposite directions. Specifically, as shown in Table 2, the scores on 3M inspections are negatively related to the percentage of enlisted personnel who had attended one or more LMET courses. This is shown by the ρ_s of -.2093. However, 3M inspections scores were positively correlated with the percentage of officers with LMET training ($\rho_s = .1940$).

Interestingly, if one expands consideration to significance at the $\alpha = .10$ level, this same trend is noticed in correlations between 3M and average time since attending LMET. Here the signs of the coefficients are reversed (positive for enlisted, negative for officers) because of the "reverse" nature of the "Average yr since LMET" variable. The coefficient for enlisted years since attending LMET (.1904) indicates that as the number of years since attending LMET increases (to a maximum of eight per person), the scores on 3M inspections tend to increase. Conversely, the coefficient for officer years since attending LMET (-.1903) indicates that as the average number of years since attending LMET increases, the scores on 3M inspections tend to decrease. In other words, it appears as though those ships which have, on average, more recent enlisted graduates of LMET tend to attain lower scores on 3M inspections; whereas ships which have, on average, more recent officer graduates of LMET tend to attain higher scores on 3M inspections.

"First Term Retention" was the only other MOE to correlate significantly with any of the LMET variables. The percentage of officers who had attended LMET was positively correlated with first term retention rates. Those ships which had higher

percentages of officers who had attended at least one LMET course tended to have higher rates of retention of first-term personnel. Reinforcing this finding is the negative ρ_s between first term retention and average years since attendance for officers.

B. PACIFIC FLEET RESULTS

There were more significantly related measures for Pacific Fleet ships than for the Atlantic Fleet, however, the results were mixed. Some significant relationships between the C-rating indicators of readiness and LMET attendance were found. What the results show is that the percent of time ships spent in categories C-1 and C-2 is negatively related to the percent of officers with LMET. To some extent, percent time in C-2 is also negatively correlated with percent of enlisted personnel with LMET training. This can be interpreted to mean that as the percentage of officer personnel with LMET increases the percent time that the ship is either fully or substantially combat ready *decreases*. This general trend is continued with significant positive correlations between percentages of LMET trained officer personnel and percent time spent in C-3 and C-4 (marginally and not combat ready). These results are contrary to expected improvements in readiness as a result of LMET training of personnel. As one might expect "Average yr since LMET - Officers" and"Average yr since LMET - Both" were also significantly correlated (with opposite signs due to the "reverse" nature of the variables) to C-rating variables (with the exception of "% Time in C-1").

Other measures of effectiveness which correlate significantly with LMET attendance include first term retention, second term retention and career retention. These variables were negatively correlated with "Percent Enlisted w/LMET" and positively correlated with "Average yr since LMET - Enlisted" (although not significantly for "First Term Retention"). To interpret this: those ships which had higher retention tended to have fewer LMET trained enlisted personnel. Those ships with higher retention also had a higher average number of years since their enlisted personnel had attended LMET (this average is also affected by setting the number of years since attendance to eight for people who had never attended).

C. SUMMARY

As shown in Tables 1 and 2, the majority of "cells" did not indicate a significant relationship between MOE and LMET variables. In fact, correlations which did appear significant were not present in both fleets. Many of the significant correlations

were counterintuitive and so deserve closer scrutiny. Results were, at best, mixed and did not point to any strong relationships between LMET and fleet effectiveness; although weak relationships were shown for some measures--usually on the order of ρ_s = .19 to .27. These results can lead to tempered conclusions and several suggestions for improved research in the area of LMET evaluation and fleet measures of effectiveness.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

There is a measurable relationship between LMET and several fleet MOEs, however, this relationship was not consistent in both fleets and was mixed or counterintuitive in some cases. For the Atlantic Fleet, only two measures had significant relationships to any LMET variables--3M inspection scores and first term retention. The relationships were opposite for officer and enlisted LMET, the latter having a counterintuitive relationship with 3M.

For the Pacific Fleet ships, there were many more significant relationships, but they were primarily in two areas: C-ratings and retention. Once again the results were often the opposite expected--the *more* time the ship spent in C-1 or C-2 (combat ready or substantially combat ready), the *fewer* personnel had attended LMET. Officer LMET did correlate positively with career retention indicating some benefit from LMET.

Why were the relationships between LMET and fleet effectiveness scant and in some respects, counterintuitive? There are several possibilities:

- The data on LMET attendance may not be accurate. The system for reporting course attendance to NITRAS contains a number of "holes" and "bugs" leading to a reputation for unreliable data, especially with regard to older data (LMET records were scanned as far back as 1978, when the course was first taught).
- The data on measures of effectiveness lack clear reliability and validity. High year to year variability and instability of ship performance measures were found by Chatfield and Morrison of NPRDC [Ref. 30]. Some measures used could be considered parochial (OPPE, SMI) and thus were not truly indicative of *shipwide* performance.
- LMET may not be having the desired effect on attendees' subsequent performance. It may in fact be counterproductive.
- LMET may sensitize graduates to imperfections in the fleet environment causing them to be less likely to reenlist (see Chapter V, Table 2).
- Competencies and behaviors learned in LMET may not be reinforced (rewarded) in the fleet. Behaviors not at least intermittently rewarded (through recognition and approval) tend to extinguish rapidly. No measure of degree of command support for LMET could be made. Only the number of people in each command with LMET was measured--not the extent to which LMET competency use is rewarded and reinforced. As stated by George Eggert in an

article on management development, "It is unwise to 'develop' behavior in training programs that will not be reinforced back on the job" [Ref. 33]

- Selection bias regarding who attends LMET (especially TAD) may be occuring. Supervisors and department heads might tend to send those whom the ship can best afford to lose for two weeks rather than reward their best performeres with two weeks of leadership training. LMET may also be given to higher propertions of junior versus senior supervisors.
- Sending people TAD to LMET may leave those ships who send *more* personnel shorthanded, temporarily compromising readiness.
- The differences in the results for the Pacific and Atlantic Fleets may reflect variation in:
  * inspection standards and differences in inspection teams
  * operation schedules and missions
  * frequency of inspections, drills, and distinguished visitors
  * reporting methods and criteria
  * Fleet "climate" (prevailing attitudes and priorities)
  * LMET sites, instructors, etc. (East vs. West Coast)

Though essentially speculative, the possible reasons behind the trends in the data point to a need for further evaluation. Not only should the method and content of LMET be examined but also the methods by which the Navy measures the effectiveness of its fleets.

The ultimate standard that must be used in judging the usefulness of any organizational program is whether or not that program is making an impact on "the bottom line." For the U.S. Navy, the bottom line is not a profit figure, but something called readiness or effectiveness. Measuring this effectiveness is something the Navy attempts to do in many ways--only a few of which were included in this study. These data are collected for a myriad of purposes among which are:

- to insure units are meeting minimum standards
- to aid in operational planning
- to gauge whether a unit is prepared for deployment or operational assignments
- to provide input for unit awards

Often secondary uses of the information, such as input to the Commanding Officer's fitness report or unit award nominations, can obstruct the accurate recording reporting of data. Inspections often become an end unto themselves. The objective becomes--passing the inspection--instead of maximizing overall effectiveness and capability. A CO may delay the transfer of key supervisors onboard until after a

major inspection and then lose a substantial proportion of his key people just prior to deployment. Many ships use their "first teams" for inspection/training drills as much as possible allowing other watch sections to lag in their proficiency.

All of the measures available for this thesis have at least some limitations ranging from inconsistent reporting methods, to ship to ship differences in standards, to inflation of grades, to "fudged" reports. Even the data regarding LMET attendance are regarded as potentially unreliable--probably in the direction of not including everyone who had attended LMET (the technicians at NITRAS could not assure the authors that all LMET attendance had been recorded for all courses since 1978).

Some additional considerations and limitations in applying and interpreting the results of this study:

- The technical nature of 3M inspections and OPPEs--these measures are influenced by the seniority and skill of personnel in certain divisions/departments.
- Wide variation in ship type which in turn means differences in mission, operational schedule, homeport, command climate, etc.
- Variations in ships' age, maintenance status, and crew mix (senior/junior, officer/enlisted)
- No control group--as Davies mentioned, the Navy's policy is not to systematically deny LMET training to any targeted group [Ref. 19] In fact Navy policy is to send *all* personnel headed for sea duty to LMET (see chapter I).
- The results of past studies regarding LMET effects on behavior change [Refs. 20,21,22] indicated no systematic relationship between LMET and improved leader performance.

The LMET program has gone unevaluated with regard to its effect on operational unit performance for nearly ten years now. To date (including this study) no clue has been found that the training helped a single ship. If nothing else, this study should provoke more extensive efforts to evaluate LMET against effectiveness measures on a Navywide basis.

B. RECOMMENDATIONS

1. Improvements to LMET

The following recommendations for improvements to LMET are based primarily on literature review:

- Continue current efforts to include aspects of the Model for Command Effectiveness [Ref. 24] in LMET curricula. This will give the LMET graduate more of a "systems" view of an organization--how the components and forces within and external to the organization interact and impact upon the overall effectiveness of the unit.
- Make further efforts to tailor the courses to the developmental needs of officers and NCOs to the stage (early or mid-career) and to the field (warfare or staff community).
- Instructors should be closely screened. They should be volunteers, have superior training facilitation skills, and be proven in leadership performance. This recommendation may be difficult to implement given the reputation of LMET and HRM billets as "not career enhancing".
- Reexamine the methodology--Does LMET include the best known state of the art methods for teaching the objectives of LMET? If time is limited are learning objectives prioritized and the most effort spent on the most important/difficult areas.
- Given improvements in LMET delivery and content over the last few years, provide more opportunities for attendance by NCO's. Officer training has been systematically included in the transfer training pipeline (SWOS Basic, SWOS Department Head School, PCO/PXO School). Soon, if not already, many officers will have received LMET at all three levels--not as a redundant course, but at appropriate depth and emphasis for each target group. Enlisted supervisors in this study received LMET in consistently lower proportions than their officer counterparts.
- One promising program is the "mobile" LMET team that can perform the training for all levels (in appropriate groups) within a single unit. The teams are often able to incorporate unit specific issues into the course. This technique may be one of the best methods for achieving "critical mass" [Ref. 23], a sufficient proportion of LMET trained supervisors within the unit to assure agreement and support of LMET competencies.

2. Areas for Future Research

- By sampling a smaller number of commands and collecting data directly from the ships, research can be conducted at several levels, e.g., LPO, LCPO, Junior Officer, Senior Officer. Also this approach might allow breakouts of the data by departments or even work centers and individual ratings. A smaller sample might also allow the use of measures in addition to those studied here which are only available at the unit level such as departmental drill performance, underway hours, and inspection comments, and individual performance data.
- Select a smaller sample of "excellent" and "average" commands based on criteria such as those used in the Command Excellence Study [Ref. 24] and perform an analysis of variance to determine whether the level of LMET training is different between the two groups.

- Use other Measures of Effectiveness in a similar study:
  * Monthly Training Reports
  * PQS accomplishment
  * Departmental Excellence Awards
  * INSURV
  * NWTI (Nuclear Weapons Technical Inspections)
- Develop a control group--a group of ships on which no members have had LMET; then measure their accomplishments over a period of time compared to similar ships with LMET trained personnel.
- Expand the study to other Navy communities--aviation, submarine, special warfare, shore, etc.
- The authors also agree with and offer several recommendations made by Chatfield and Morrison regarding Navy MOEs:
  * Commit resources for improving measures of readiness and develop new, carefully constructed indices of ship readiness.
  * Measures should assess true operational readiness rather than administrative procedures and equipment status.
  * Assessments should be perceived to contribute to the capability of the unit and not as inspections for inspection's sake.
  * Centralize and automate all readiness rating recording and analysis. Eliminate redundancy and weight measures according to their importance to the fleet.
  * Use only external assessment teams or individuals.
  * "Surprise" inspections should be random and live up to their name.
  * Standardize the content, administration, and analysis of assessments. [Ref. 30]
- Leadership training should be included in studies using multivariate models to predict organizational effectiveness and productivity.
- Experimentation regarding what the optimum form of LMET is: maximum benefit to cost ratio, optimal career points for training, optimum course length for each career point.
- Implement surveys of TAD graduates' COs at all LMET sites (see Chapter III, LMET sites)

C. SUMMARY

The Navy, like other military organizations, faces complex leadership problems and therefore complex training issues. Leaders must be capable of converting their methods and styles to combat situations as quickly as the need arises. Navy

supervisors must cope with a variety of challenges including increased technology; smarter, more capable, but fewer sailors; and fast paced changes in the operating environment. Leadership and management tasks are occupying more than half the time of most personnel above the grade of E-6. Shouldn't leadership and management training be given a higher priority given its relative domination of NCOs' and Officers' time?

Joseph Olmstead, in a 1980 report on leadership training, said this in conclusion about leadership training:

> Without a doubt, the quality of available leadership at all levels determines the character of an organization and the effectiveness with which it accomplishes its objectives. Accordingly, the development of individuals who occupy leadership positions is one of the most critical functions in any organization.
>
> Although difficult when conducted properly, effective training for leadership is feasible. Despite the fact that the field is in a state of disarray and many programs are not very effective, there is sufficient evidence to conclude that leadership can be taught when training is sincerely deemed important by managements and when it is thoughtfully designed and carefully implemented. [Ref. 34]

APPENDIX A
VARIABLE LIST

LMET Variables	Mean*	Minimum	Maximum	N
% Enlisted w/LMET	42	21	66	285
% Officers w/LMET	79	33	100	285
% Both w/LMET	48	28	65	285
Average years since attending LMET - Enlisted	5.5	4	7	285
Average years since attending LMET - Officers	3.3	1	6	285
Average years since attending LMET - Both	5.1	4	7	285
MOE Variables	**Mean***	**Minimum**	**Maximum**	**N**
Percent time in C-1	**	**	**	285
Percent time in C-2	**	**	**	285
Percent time in C-3	**	**	**	285
Percent time in C-4	**	**	**	285
3M Inspection Scores	87	65	98	220
Refresher Training Scores	1.2	0.0	2.0	132
Operational Propulsion Plant Exam Results	.63	0.0	2.0	122
Supply Management Inspection Results	2.8	1.0	4.0	123
First Term Retention	.50	.00	1.00	272
Second Term Retention	.68	.00	1.33***	270
Career Retention	.78	.00	1.10***	269

*The reader should be cautioned that *mean* values for variables that are either already expressed as an average or proportion/percentage can not be interpreted as the *fleet average* for that variable, but rather the arithmetic mean of the entries for all ships.

**Withheld due to classification of source data

***Retention figures greater than one are possible when an individual reenlists prior to their "eligibility window" creating a situation where more persons reenlist/extend than were counted as "eligible for reenlistment".

APPENDIX B
COURSE NUMBERS USED TO DETERMINE LMET ATTENDANCE

Course Number	Course Name	Yrs in effect*
A-012-0037	Recruit Company Commander	1983-1985
A-012-0045	LMET Instructor	NA
A-4H-0107	SWOS Department Head	1978-1982
A-4H-0111	Prospective Commanding Officer	1978-1985
A-4H-0112	Prospective Executive Officer	1978-1985
A-4H-0118	SWOS Basic	1978-1985
A-500-0033	BT/MM Six Year Obligor LMET	NA
A-500-0034	LMET for Leading Petty Officers	NA
A-500-0036	LMET for Leading Chief Petty Officers	NA
A-7C-0022	LMET for Division Officers	NA
A-7C-0025	LMET for Aviation Division Officers	NA
A-8B-0012	Supply Corps Officer Basic	1978-1985
P-00-4302	Officer Indoctrination School	1981-1985

* Indicated only for courses that were not strictly LMET courses

APPENDIX C
ATTENDANCE FIGURES FOR LMET COURSES

Course Name	Number Attended	% Attended
Attended no LMET	26,774	51.65
Recruit Company Commander	200	.39
LMET Instructor	37	.07
SWOS Department Head	972	1.88
Prospective Commanding Officer	310	.60
Prospective Executive Officer	373	.72
SWOS Basic	3,622	6.99
BT/MM Six Year Obligor LMET	511	.99
LMET for Leading Petty Officers	14,441	27.86
LMET for Leading Chief Petty Officers	3,453	6.66
LMET for Division Officers	323	.62
LMET for Aviation Division Officers	98	.19
Supply Corps Officer Basic	643	1.24
Officer Indoctrination School	76	.15

Of those who attended LMET 88.2 percent attended only one course; 10.2 percent attended two courses; 1.5 percent attended three; and .1 percent attended four or more courses.

APPENDIX D
DISTRIBUTION OF YEAR OF ATTENDANCE

Year	Frequency	Percent
1978	40	0.2
1979	505	2.1
1980	1,170	4.8
1981	2,372	9.7
1982	4,913	20.0
1983	5,797	23.7
1984	4,994	20.4
1985	4,714	19.2
Total	24,505	100.0

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